

# Manual VirtuSwitch



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## Introduction

"VirtuSwitch" provides a communication solution, when the the head / eye coordination of the person concerned firstly is already so limited, that no onscreen keyboard via head / eye control can be satisfactorily operated, and secondly, no or only an extremely limited ability exists, to maintain communication via physical buttons over switch control.

For this purpose, 4 virtual buttons are shown on the screen (freely placeable), which via head / eye / gyro control and optional physical Next / Select switches, control the supplied "speaking letter board" including word prediction. Two buttons are used for direct deletion or new line, in order to additionally speed up the input. Another "Help" button speaks a help text to call carers / caregivers.

The affected person only has to be able to coordinate a minimal path with the head / eye control or a body part (gyro control) in order to "shuttle" between the "Next" and "Select" buttons. At e.g. necessary repeated pressing of the virtual "Next" button, only a slight movement on its surface can lead to a renewed trigger.

In addition, physical buttons can be used additionally to support a mixed operation of virtual and physical buttons.

The "Notes" application provided by the system is automatically kept in the foreground focus and used as a chat and documentation program for the resulting texts.

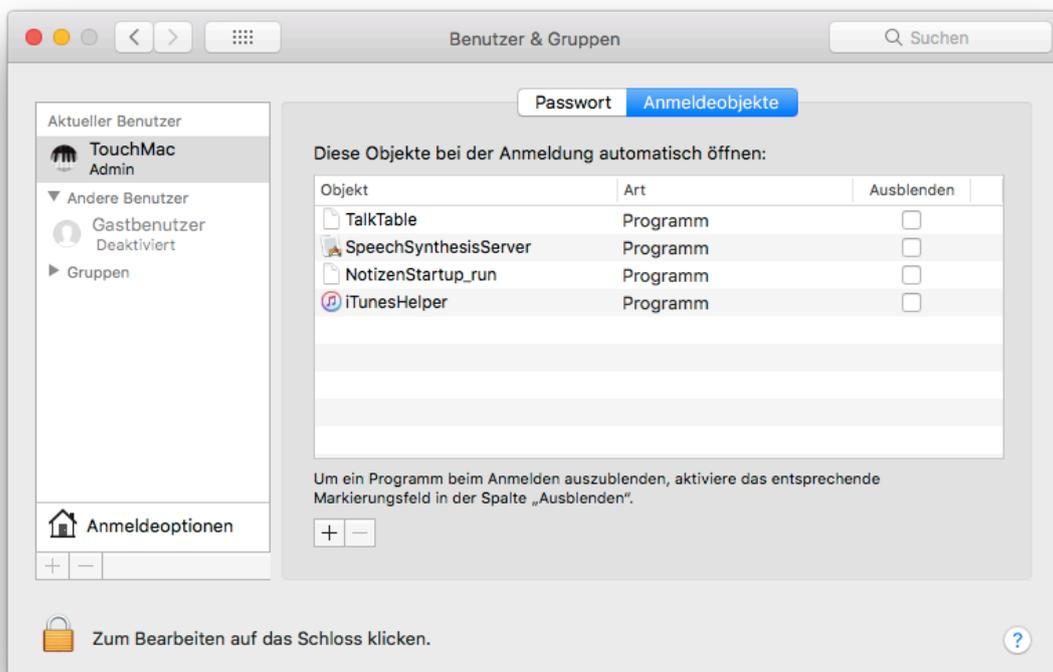
*The accessibility settings vary slightly depending on the macOS version (Sierra 10.12, HighSierra 10.13, Mojave 10.14). These screenshots are from High Sierra 10.13. In macOS 10.12, the on-screen keyboard must be set up in the menu item "Switch control"*

## VirtuSwitch How To

- 1) Mount "VirtuSwitch\_Package.dmg" by double-clicking.
- 2) Drag the VirtuSwitch Package to any one Folder on the Mac.
- 3) Start VirtuSwitch with a double-click.

For automatic start of the application at computer startup:

- Open System Settings -> Users & Groups
- Select login item objects tab
- Use drag & drop or press the + button to add the „VirtuSwitch“ application
- The next System startup will automatically launch „VirtuSwitch“



- 4) The buttons in the "GyroSettings" window "GYRO On", "Calibrate Gyro" and "iPhone Horizontal / Vertical" are only relevant for gyroscope control via iPhone / iPod Touch. Details below under "Gyroscope control set up".

**If a head- or eye control is used, these buttons and parameters can be ignored.**

- 5) In this window also the X / Y angle sensitivity (Angle) for the screen deflection and the damping (Smoothing) of unwanted (jitter) movements for the gyroscope control can be set.

X / Y values: 1 generates maximum screen deflection (very coarse)

X / Y values: 50 generates minimum screen deflection (very fine)

Smoothing: 1 no damping of movement

Smoothing: 50 extreme damping of movement

It is recommended to start with the default settings and to optimize the values when practicing the procedure.

- 6) Important for helpers / carers is the F10 key, this can be used to pause the gyroscope control, for example to change settings on the computer. By clicking on the yellow pause window, the gyro control is reactivated.

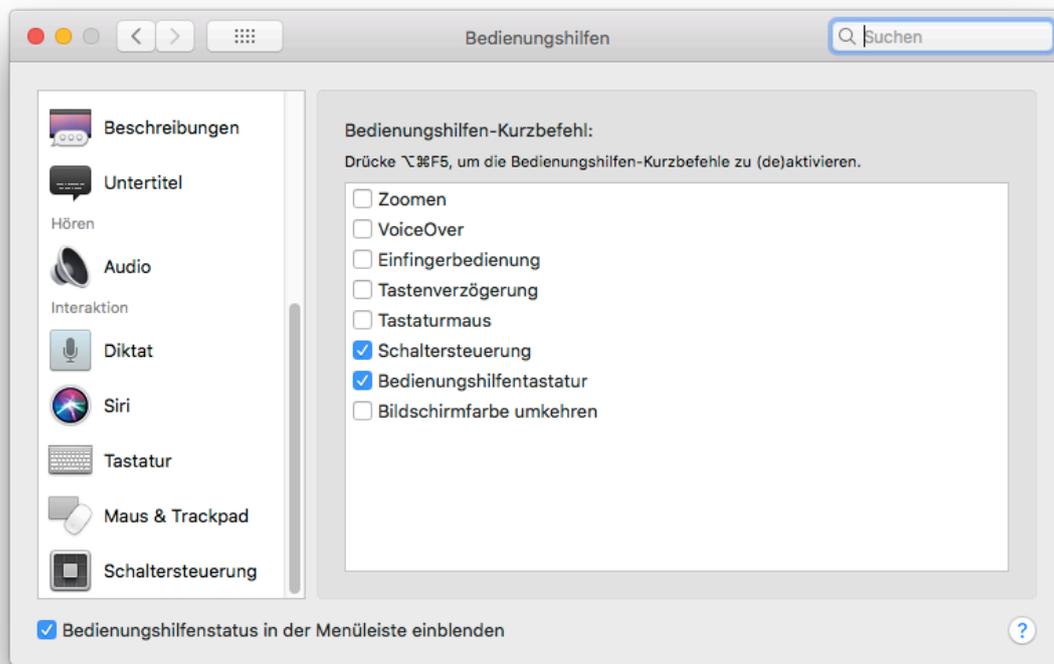
**ALL SETTINGS WILL BE AUTOMATICALLY STORED AND RELOADED AT THE NEXT START.**

## The Virtual Switches

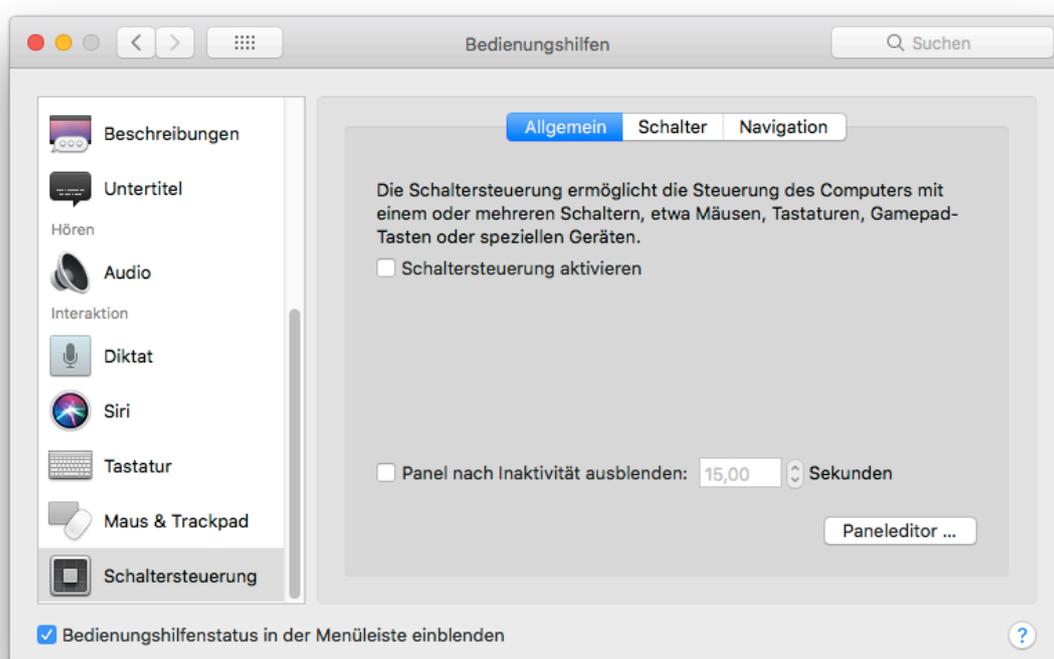
- 1) With activated letter board, activated switch control and the "Notes" application, dwell clicking on the virtual NEXT button, the selected letter line can be moved one step further.
- 2) With dwell clicking on SELECT the current line is selected, and the subsequent clicks on NEXT now move the selection through the letter line.  
Press SELECT again to select the currently active letter, which is spoken aloud and shown in the "Notes" application.
- 3) If the "Notes" application is in the foreground, SELECT automatically generates a word prediction in the top line of the letter board. This line and the suggested words can as well be selected with NEXT / SELECT. When a appropriate word is selected, it shows up in the „Notes“ application.
- 4) The additional DELETE and NEW LINE buttons allow for speeding up the text creation process, as they avoid to have to jump through the letter board for these functions.
- 5) The HELP button speaks a help text to call caregivers.

## Activate the Communication Table (letter board)

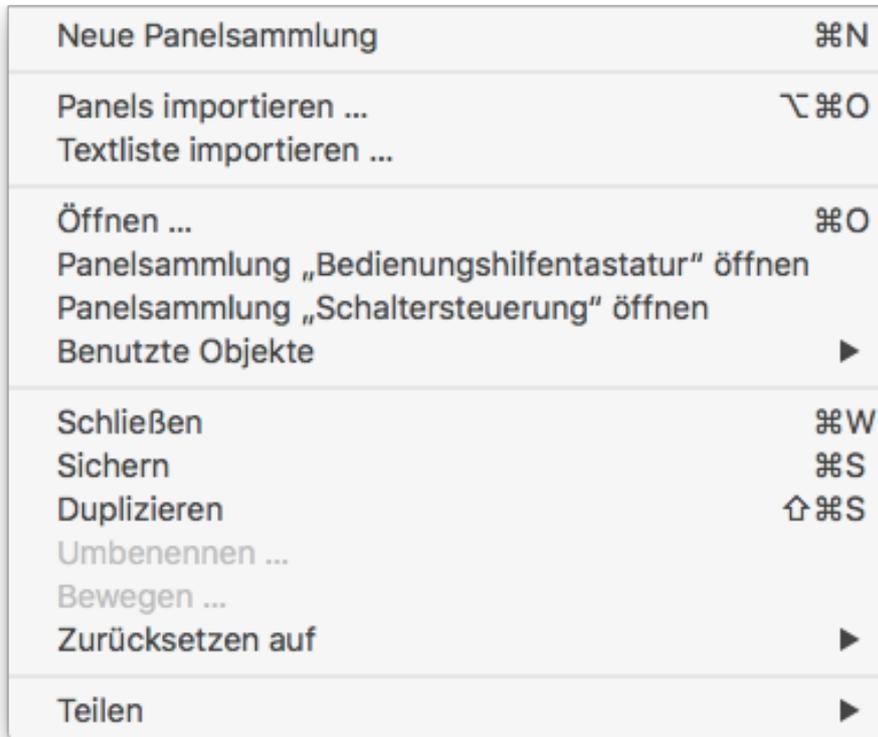
### 1) Open System Settings → Accessibility



### 2) Select Switch Control



### 3) Select Paneleditor and import „BeneSwitch Panel“



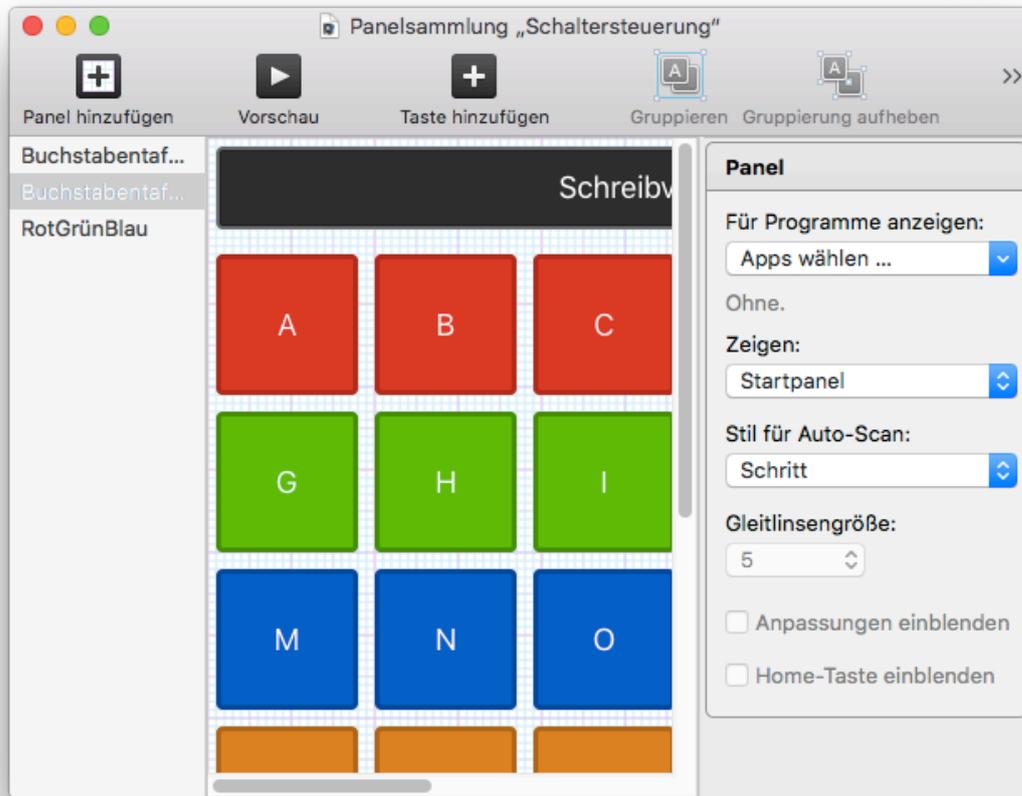
### 4) Select „Buchstabentafel alphabetisch“ or „... optimiert“.

In the display panel on the right, set the Show: pop-up menu to "StartPanel" so that the letter board starts up automatically.

Then - IMPORTANT - save the setting with "Save"

The „letter board" with word prediction is available in two variants for different users.

In the first case, the keys are arranged alphabetically, in the second case according to the statistical frequency of letters in German words.



- 5) Activate Accessibility Switch Control in the Switch Control Accessibility window with check mark.

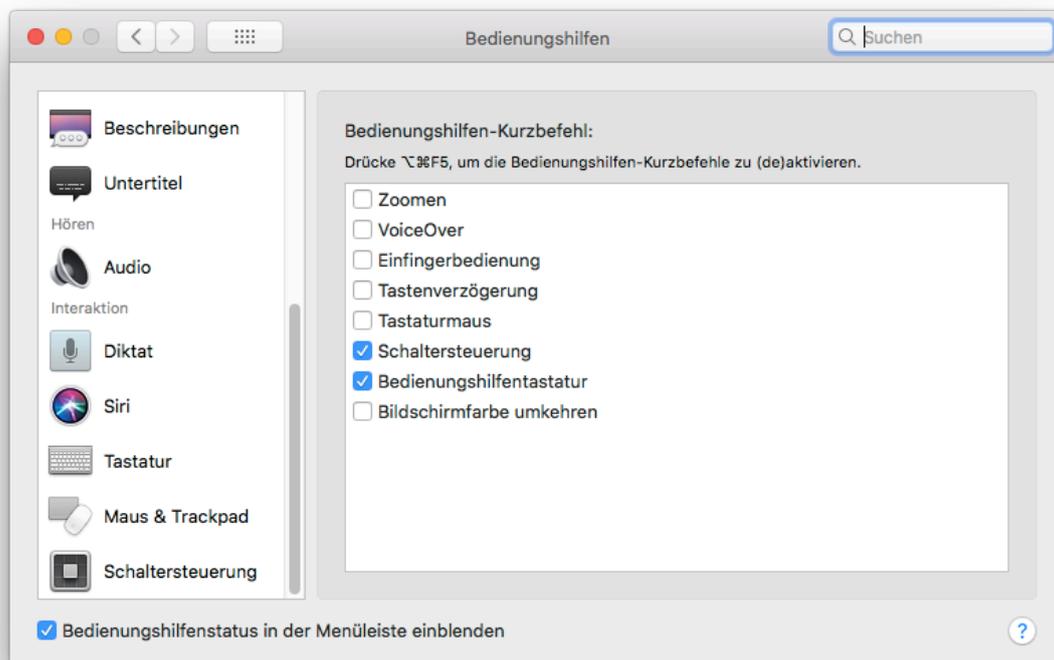
In the "Navigation" tab of the Switch Control Accessibility window, you can also set the extent to which the letter board "speaks" the selected letters and word predictions, or if it only plays sounds or no sounds at all.

Furthermore, the restart position after passing through, and the time behavior with selected auto-scanning can be determined.

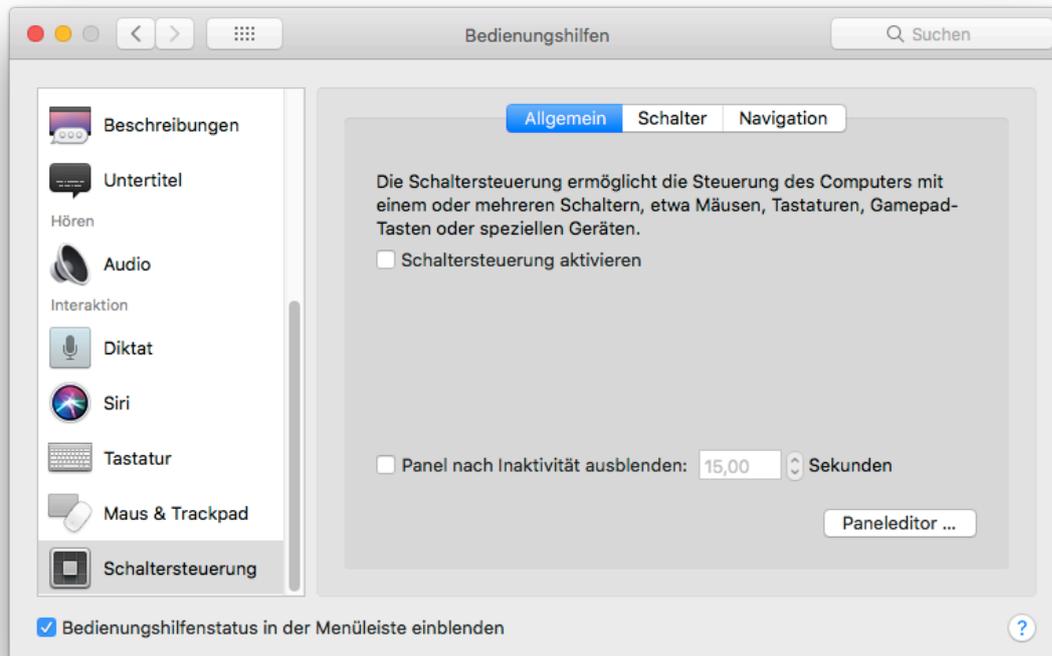
## Activate the Switch Control

*(necessary with mixed head / eye / gyro plus switch control operation)*

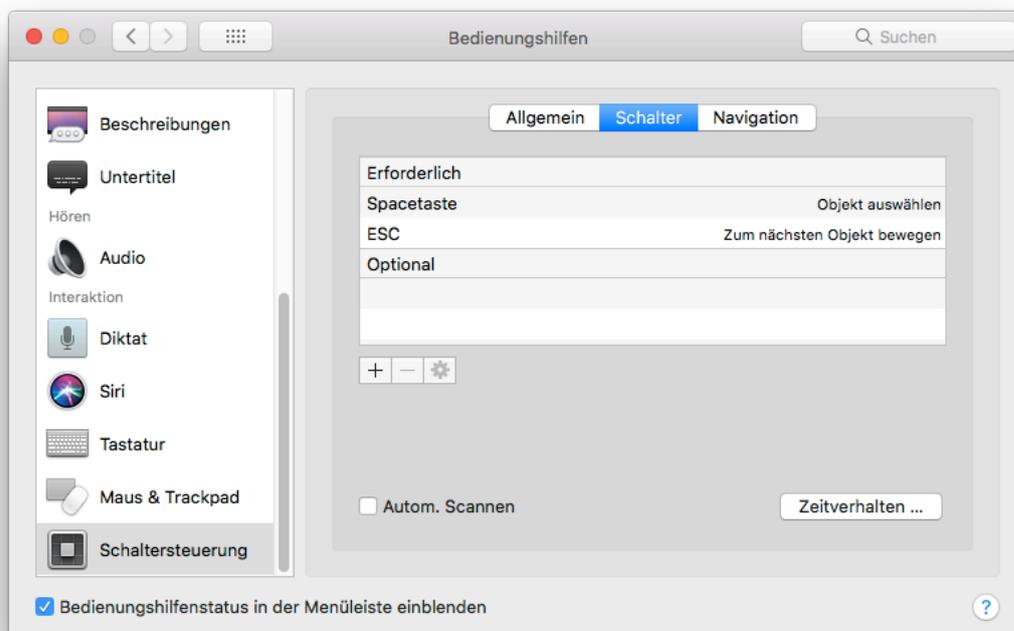
### 1) Open System Settings → Accessibility



## 2) Switch Control → select Switches Tab

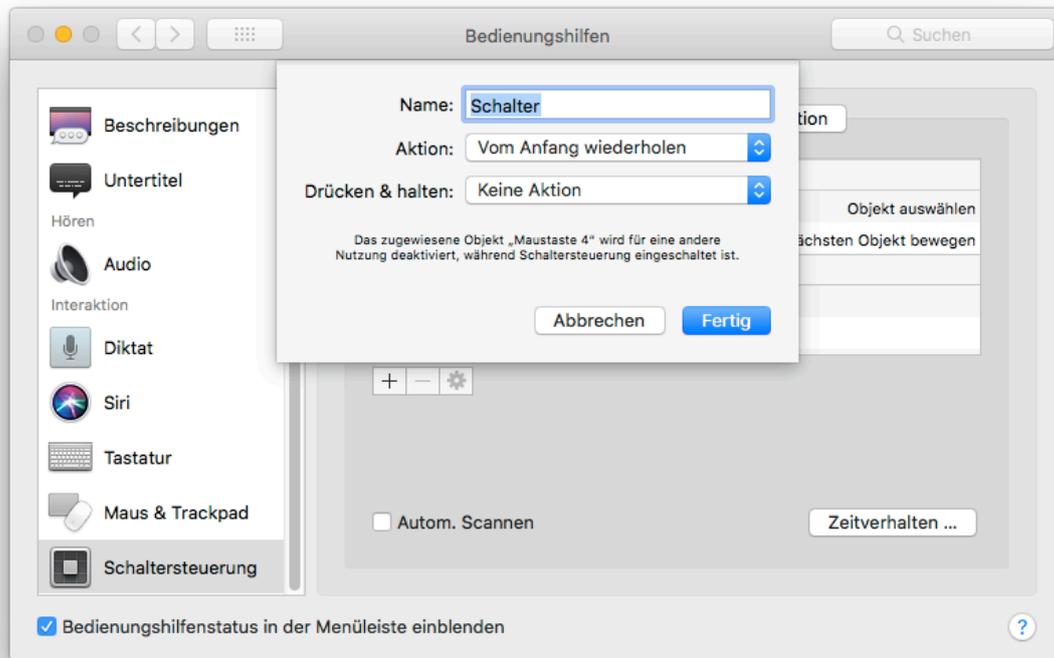


## 3) In the "Required" area, assign the Space key to the "Object select" function and the Esc key to the „Go to next object“ function (double-click on line, see also 4).

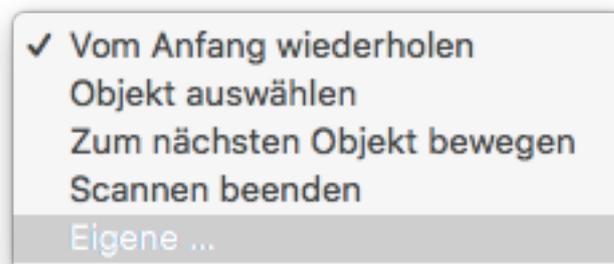


**This basic assignment is required for the VirtuSwitch buttons to work properly.**

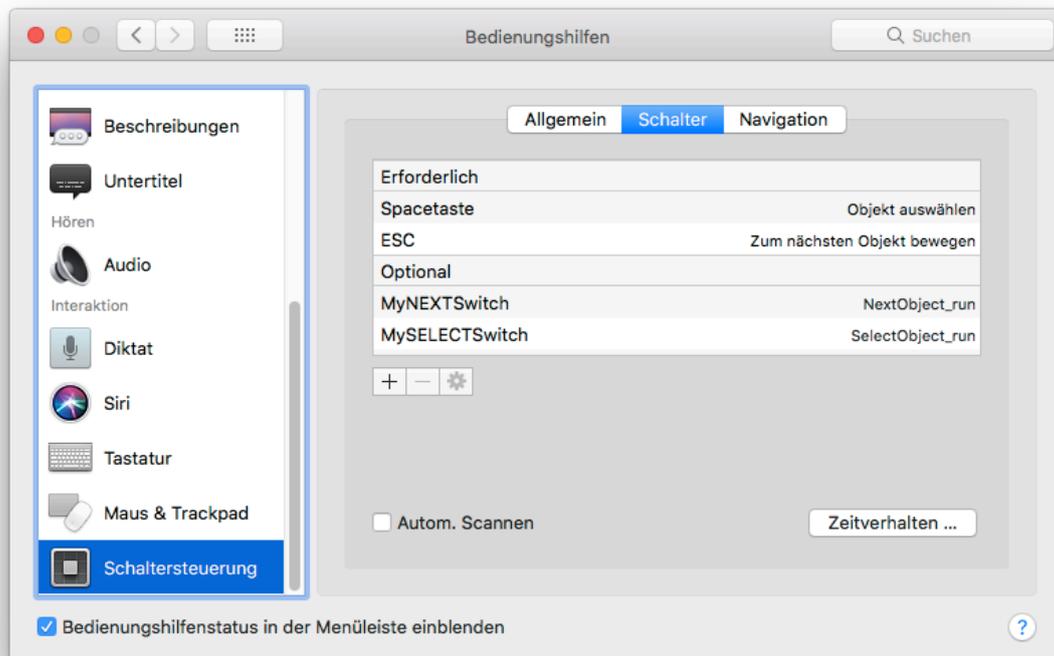
#### 4) Assignment of additional button functions (example here with two external buttons as additional NEXT / SELECT buttons)



- When the switch interface is connected, click the **+** button
- The "**Press switch now ...**" dialog appears
- Press external switch (for NEXT) -> Switch dialog appears
- In the popup menu **Action:** select „Own...“, and in the following selection dialog choose the provided script "NextObject\_runs".



- After selecting the script, name the button in the reappearing dialog and finish with "Done".



- Same procedure with "SelectObject\_runs" Assignment for the second external button (SELECT).
- Thereafter, both buttons are assigned to the switch control and usable for the letter board parallel to the head / eye / gyro control.

## Activate system-internal dwell control

*If a dwell control has already been installed by the head / eye control, this step is not necessary. Therefore you may then consult the instructions of the head / eye control.*

- 1) In the Keyboard Accessibility window, select the "Dwell Control Options" window. In "dwell action" select the menu item "left click".
- 2) Set default dwell time and movement tolerance according to the user's ability. It may be helpful to display the behavior actions in the menu and / or keyboard panel.
- 3) The running circle around the mouse position can be hidden with "hide dwell time display". Confirm with OK.



## Setting up Gyroscope Control

### Settings in the app:

- 1) Open "GyrOSC" App on the iPhone / iPod Touch.
- 2) On the first page, enter the destination IP address (computer).
- 3) Set port to 8000.
- 4) On the second page deactivate all sensors except for „Quaternion“.
- 5) Back to the first page, under "Send" only the OSC message `/gyrosc/quat {w x y z}` should show up.
- 6) The different setups for different computers can also be saved on this page.



## Settings in VirtuSwitch:

- 7) If the IP address and port in "GyrOSC" are set correctly, the gyroscope control will take over the mouse pointer function. After the first startup, after 5 seconds, the current iPhone orientation is automatically calibrated to the center of the screen. This is indicated by vibration of the iPhone.
- 8) For manual calibration, a 5 second countdown is started by clicking on "Calibrate" during which an optimal positioning can be carried out. At the end of the countdown, the current iPhone orientation is calibrated to the center of the screen. Clicking on the top of the first page of the "GyrOSC" app, e.g. by a caregiver, immediately calibrates the current orientation of the iPhone on the center of the screen (without countdown).
- 9) The default orientation for iPhone is portrait mode (vertical) while looking at the display. When using / mounting the iPhone in landscape mode (horizontal), this must be calibrated by clicking on the "Horizontal" button.
- 10) Clicking on the numbers, the X / Y angle sensitivity (Angle) for the screen deflection and the smoothing of the unwanted (jitter) movements can be set.

X / Y values: 1 produces maximum screen deflection (very coarse)

X / Y values: 50 produces minimum screen deflection (very fine)

Smoothing: 1 no damping of movements

Smoothing: 50 extreme damping of movements

It is recommended to start with the default settings and to optimize the values when practicing the procedure.

- 11) In the main window, a new position calibration can be performed at any time by clicking on the "Calibrate" or "Horizontal / Vertical" button.  
By clicking on "Gyro On" (Ctrl / Cmd) the gyroscope control can be switched off completely.

12) Important for helpers / carers is the F10 key, this can be used to pause the gyroscope control, for example to change settings on the computer. By clicking on the yellow pause window, the gyro control is reactivated.

## Using "Notes" as chat program

The system provided „Notes“ app is ideal for use as chat program. It allows the entry of text and its automatic storage with date / time reference as so called notes.

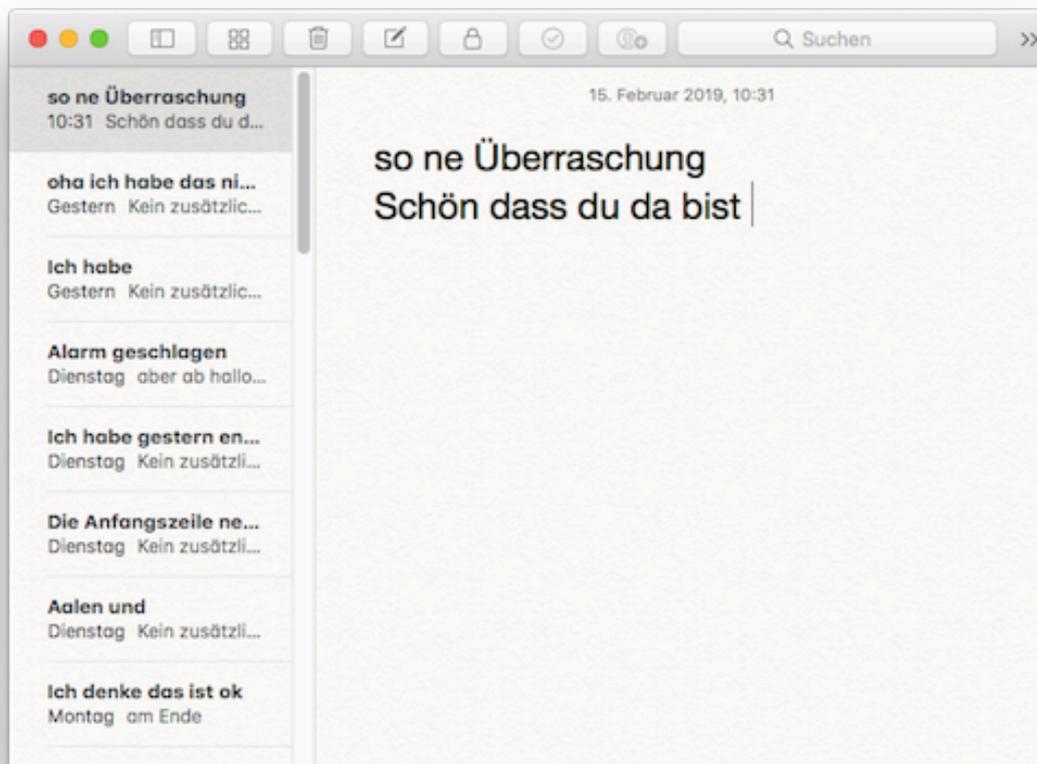
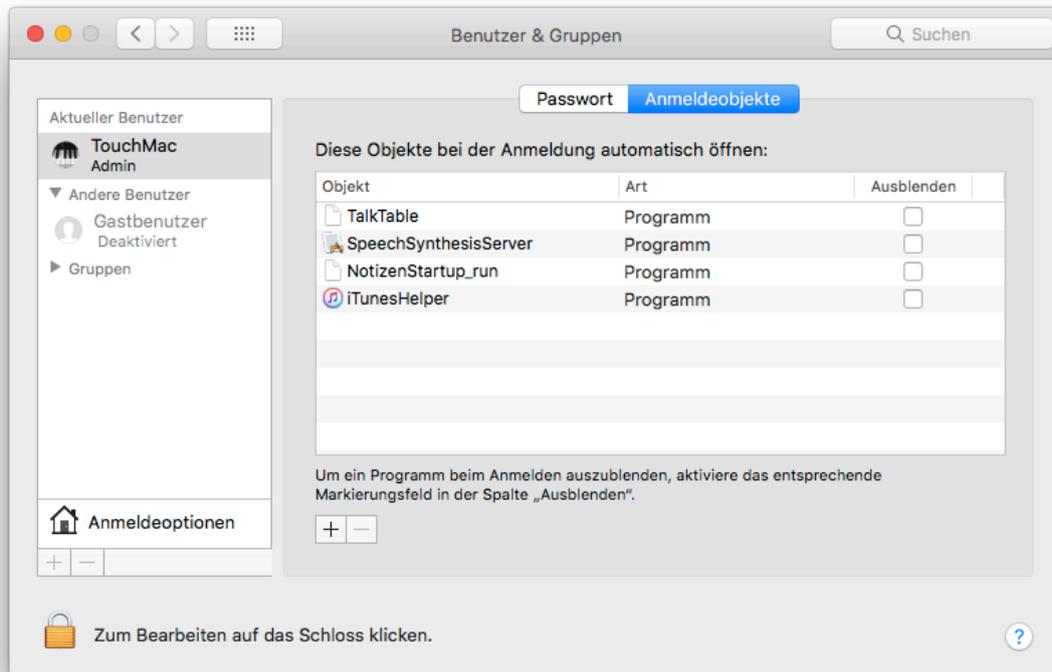
This can be of great help to carers / helpers e.g. at a personnel change to understand the history up to the current state of the user.

In the program itself, the desired standard text size can be set once under "Settings".

By installing the Apple Script "NotesStartup\_runs" in the "Login Items", "Notes" is automatically started at each computer startup and a new note with date / time is created.

- 1) Open System Settings - Users & Groups
- 2) Select login item objects tab
- 3) Use drag & drop or press the + button to add the „NotesStartup\_runs“ script. The next System startup will automatically launch "Notes" and sets the mouse focus on it.

**The installation of the script is important, because it ensures that the focus is always on the "Notes" application when booting up and thus the generated texts automatically appear in it.**



## Use iOS / Android Switch app

For "VirtuSwitch" there is also a possibility to operate the switch control for the letter board via iOS Device or Android Device with the software "TouchOSC".

For this purpose, two templates are included, which can be loaded via the TouchOSC Editor on the appropriate smartphone.

After setting the IP address (computer) and the port (8000), the smartphone can replace or supplement physical buttons via WLAN.

For more information about TouchOSC see also: [www.hexler.net](http://www.hexler.net)

Customized layouts and functions can also be created on request for this type of remote control.

